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This Volume is dedicated to the memory of

WILLIAM SPRINGER RICHARDSON

by some of his friends and associates in

appreciation of his contributions

to Physical and Chemical Oceanography

WILLIAM SPRINGER RICHARDSON
1923–1975

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Nova University, Physical Oceanographic Laboratory, 1966–75. Director and Professor of Oceanography.

WILLIAM SPRINGER RICHARDSON

"Would thou,"—so the helmsman answered,
"Learn the secrets of the sea?
Only those who brave its dangers
Comprehend its mystery!"

—*Longfellow*

The sea has taken Bill Richardson, an oceanographer of protean talent. He was a chemist, physicist, engineer, sailor, flier and author. He combined ideas from many disciplines to produce the scientific tools needed by physical oceanographers.

Richardson was born in Providence, Rhode Island, on October 27, 1923. He served as a Naval pilot during World War II. He received his Sc.B. in chemistry from Brown University in 1947, studied at Harvard with Professor E. Bright Wilson, Jr., and received his Ph.D. in 1950. For the next two years he pursued his studies of polymer structure as a fellow of the Mellon Institute.

At that time, Henry Stommel, Arnold Arons and Donald Parsons were engaged in some infrared studies at Woods Hole, trying to build a device that could be flown in an airplane to measure sea-surface temperature, to be used over the Gulf Stream[1]. They asked Professor Wilson to recommend someone to take over the project. As a former student of Wilson's and a former Navy pilot, Bill Richardson was doubly qualified. During his first years at Woods Hole he succeeded in building and testing several models and in conducting the first set of infrared surveys of the Gulf Stream. Commercial versions of the airborne radiation thermometer are now regularly flown from Navy and Coast Guard aircraft.

Richardson's interests were very broad, and it soon became evident to him that the technology being applied to oceanographic measurements at that time was quite primitive. He launched a series of efforts to invent, modernize, and apply new techniques for making measurements in the ocean. The contouring temperature recorder (thermistor chain) was such a development. Most significant of all was his pioneering effort in the development of moored instrumentation, especially moored current meters.

Prior to this time most oceanographic data came from occasional ships' cruises. Measurements were seldom taken for a long time in one place, and very few direct velocity measurements were made. In the mid-fifties, Richardson conceived of and designed a self-contained, internally recording current meter, which could be deployed on moorings to collect long time series at fixed locations. The technical difficulties associated with both the current meters and the moorings were im-

1. This paragraph and the two that follow are paraphrased from "An Appreciation of Bill Richardson's Woods Hole Period," presented by Henry Stommel at the dedication of the William Springer Richardson Library at Nova University Oceanographic Laboratory, February 7, 1976.

mense. The ultimate development of reliable instrumentation, for example, the data sets obtained in the MODE and POLYMODE programs, has given oceanographers an entirely new and fundamental basis from which to describe the ocean. This has been a great contribution to our science.

In 1963 Bill Richardson left Woods Hole for the Institute of Marine Sciences at the University of Miami. His passion for new instrumentation continued. He developed the free-fall dropsonde system for current and transport measurements using precision (Hi-Fix) navigation. With Bill Schmitz at Miami and later with Schmitz and Pearn Niiler at Nova, Richardson used the dropsonde technique to make numerous transport sections across the Florida Current at eight locations, from Key West to Cape Fear. The most recent application of this technique, a series of 50 sections across the Florida Current, completed by Irving Brooks in the summer of 1974, is reported in this issue of J.M.R. (Brooks and Niiler). Richardson's long-term interest in the Florida Current is the main reason for collecting the papers in this issue as a memorial to him.

In 1966 Richardson moved to Fort Lauderdale to found and direct the Physical Oceanographic Laboratory of Nova University. At that time the lab was completely housed in a two-story houseboat tied at Lauderdale Marina. At Nova Bill Richardson continued his dropsonde measurements and developed an aircraft-expendable dropsonde for surface current and transport measurements which does not depend on precision navigation. This permits nearly synoptic surveys over large sections of the ocean. The first major test of the aircraft technique was made during MODE. The aircraft surface current measurement technique is now used routinely by the Coast Guard.

In addition to his teaching and administrative duties at Nova, Richardson served on many panels and advisory committees. He was on the Editorial Board of the Journal of Marine Research and the Journal of Geophysical Research. In 1973 he received the Marine Technology Society award for Ocean Science and Engineering.

Most recently Richardson was developing expendable drogued satellite-tracked buoys to monitor surface currents, and several locally measured parameters, over long times and distances. One application of these buoys was to be in the Southern Oceans during the First GARP Global Experiment. To test these buoys under severe environmental conditions, he went to the Gulf of Maine in the fall of 1974. Numerous field tests were conducted during the next three months. At 10 A.M. on January 4, 1975, the Research Vessel *Gulf Stream* departed Boothbay Harbor, Maine, with William Springer Richardson and four others on board. The boat did not return.

Dennis Wilson Moore, with the aid of
Pearn Niiler, Henry Stommel, and
Mark Wimbush.

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